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Photo by Leonard Lee Rue III

A young crow shrieks as he experiences his first spring in a new world.

VIRGINIA WILDLIFE

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A Monthly Magazine Dedicated to the Conservation, Restoration, and Wise Use of Virginia's Wildlife and Related Natural Resources, and to the Betterment of Hunting, Fishing and Outdoor Recreation in Virginia

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Spring descends on Virginia in all its glory as shown by this beautiful apple tree in full bloom.

VSCC Photo by Flournoy

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J. J. SHOMON, *Editor*
D. E. CANTNER, *Associate Editor*
L. G. KESTELOO, *Photography*
FLORENCE BLANKENSHIP, *Circulation*

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Science and Resources in America

By CLARENCE COTTAM

Director Welder Wildlife Foundation, Sinton, Texas

It is time we start getting the idea over to the rising generation that America's wealth, economic security and greatness cannot be measured by the extent of its reserve gold or silver bullion nor by the amount of currency in circulation. These are merely media of exchange. The real wealth, in addition to the character, quality and health of our people, is the abundance and variety of our natural resources. It shouldn't be too hard to show our young people that a nation is rich only so long as its supply of resources is greater than the needs and living standards of its people. After that it is not self sustaining. It should be a basic concept in social studies of the grades, high school and college that no nation can permanently endure as a world power which consumes its renewable resources faster than nature with the help of enlightened scientific aid, can replace them. We must teach our youth that national security, progress and world leadership are impossible without an abundance of basic resources and that our democratic ideals with their high moral and spiritual benefits will be dangerously weakened if our resources are squandered.

It seems to me there is no clearer lesson for them in history than that men and nations are laying the foundations of their own destruction when they violate nature's inexorable laws and unwisely use and waste basic resources. There is much evidence that ruinous land and water practices sounded the death knell of the great kingdoms of Babylon and other ancient civilizations in the Mesopotamian Valley, in Phoenicia, Carthage and the Land of Canaan. Later it appears that the destruction of natural resources was a major factor in the decline and fall of Greece and Rome. China's unwise and over use of land and its mantle of protective cover, along with her over population, undoubtedly is the primary cause of her present economic plight and her defection to communism.

America's large number of ghost towns that were once thriving communities are nothing more than tombstones to dead resources. They are monuments to short sighted exploitive policies in such businesses as lumbering, grazing, mining, fishing and farming with accompanying land booms and unwise drainage. They leave us little room to point the finger of scorn at others. If we are wise we will learn a lesson from these before it is too late, and we will try to establish right attitudes of conservation ethics from the grades on up.

Every school child has been taught that America is blessed with a greater abundance and perhaps with a greater variety of essential resources than any other land on earth. These include our precious and productive soil with its agriculture and livestock, a well distributed supply of clean usable water for home, agriculture and industry, our forests, grass, fish and wildlife and our minerals and fuels and the matter and energy they produce. At the same time our youth needs to know that it is partly through the unwise exploitation of these resources that we have become temporarily, at least, the richest nation under heaven. Further, they need to realize that in the relatively short period of our national existence we have made more prodigal use of these resources than has any other people of history in a comparable period of time.

What is Conservation?

In the educational process it cannot be over emphasized that the term conservation as applied today does not mean to lock up or merely protect these resources. It means the wise use of them for all our people—the greatest good for the largest number not only for the present but for the future as well. It means wise use without abuse.

Early Conservation Standards

A few patriots, even as early as Revolutionary days, such as Jefferson, Washington, Thomas Paine and Patrick Henry stressed the need of wise use of resources, but no concerted effort was made at that time to accomplish this.

While the importance of conservation has been at least partially understood and appreciated by some of the wiser leaders of organized society since the earliest dawn of recorded history, the term as now applied came into

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Presented at the North American Wildlife Conference, St. Louis, Missouri, March 4, 1958.

use only a little more than a half century ago through the wise and dynamic leadership of President Theodore Roosevelt and his able friend and forestry chief, Gifford Pinchot. Had American leadership since 1908 heeded the warning of President Teddy Roosevelt we would be much more secure today than we are now. Before the historic Governor's Conference which he called he said: "Facts which I cannot gainsay force me to believe that the conservation of our natural resources is the most weighty question now before the people of the United States. If this is so, the proposed conference which is the first of its kind will be among the most important gatherings in our history in its effect upon the welfare of our people."

That ancient Persia recognized the social immorality of destructive land practices is shown from one of its old proverbs which reads: "God will not seek thy race nor will he ask thy birth. Alone will he demand of thee, 'What hast thou done with the land that I gave thee?' " The people of ancient Israel were enjoined similarly. The unwise stewardship of resources caused the Lord to remind his people (Leviticus 25:23) that ". . . the land is mine, for ye are strangers and sojourners with me." This philosophy is as fundamental to the preservation of our own society as it was in ancient times. It implies, and history confirms, the social wickedness of passing on to unborn generations a land and its resources impaired or wasted by selfish and thoughtless exploitation. America will be more secure when its people realize that upon individuals and peoples of each generation is imposed stewardship of land, while enduring ownership must be held in perpetuity of society of this and every succeeding generation.

American Resources

Instead of picturing America as a land of inexhaustible resources, our schools need to paint the true picture. With the rapid rise of population and over exploitive use of our natural wealth, the resource picture in America is rapidly becoming more unfavorable. In 1880 our population was 50,156,000; by 1900 it had reached 75,995,000; in 1920 it was 105,711,000 and now it exceeds 170 million. By 1975 we may be nearing the 230 million mark. Some prognostications indicate that we may have as many as 300 million people in the United States by the end of the century! Our population growth since World War II has been increasing at an average rate of nearly 1.75 percent which is above the world average. This is the highest percent of natural increase of any of the great industrial nations and it is higher even than the rate of increase for India, Japan or Italy, where over population is serious. Without considering immigration, it results in more than 2½ million additional people each year.

While this population curve is rising, our per capita income is slowing down and threatens prosperity because our resource consumption cannot keep pace with population increase. In 1950, the United States comprised 9.5 percent of the Free World's population. At that time our consumption of petroleum, rubber, manganese and iron was 24 percent to 85 percent higher than elsewhere outside the Iron Curtain. We also consumed nearly as much zinc, copper, and lead as did all the rest of the non-communist world. Generally our per capita consumption of raw materials other than food is slightly more than ten times as high in the United States as in the rest of the Free World. Our consumption of water is 22 times as high as that of European cities. With perhaps 6 to 7 percent of the world's population and land area the United States is absorbing half of the world's raw materials. And the rest of the world is trying desperately to raise its standard of living, which without population increase even, means greater drain on raw materials and natural resources. The world population is growing at the rate of about 30,000,000 per year!

In 1900 America produced some 15 percent more raw materials than she consumed, exclusive of food. In 1950 we consumed 10 percent more raw materials than we produced. In many cases our exports have turned to imports and our consumption of raw materials is growing at a compounded rate. If we continue to expand our consumption at the same pace for the next 25 years, our needs would amount to 80 percent of present world production. To illustrate this point further: Since 1914 the United States alone has consumed as much irreplaceable mineral and fuel resources as had been used by the entire world from the time of the first cave man to 1914. It seems painfully clear that the world is not keeping pace with the growing requirements of rapidly increasing populations, and in many countries, even in the primary category of food supply.

It isn't right for "T.V.," our press and our schools to picture ours as the richest land on earth, with an unlimited supply of materials always forthcoming. While America is still rich by comparison with most other great world powers, we cannot escape the distressing fact

If America is to progress in the wise management of her resources, research must stress the basic or fundamental phases as well as the applied.

that in less than 182 years, since the signing of the Declaration of Independence, we have changed from a sparsely populated, fabulously resource-rich country to a rather densely populated and relatively resource-poor country today. Like the prodigal youth we have riotously consumed or destroyed much of our capital stock when we could comfortably have lived on its interest. We have cut 4/5 of our original timber stands and we have so over grazed our western ranges that their carrying capacity is probably not over 1/3 of what it was a century ago. More seriously still, we have so abused our agricultural land that about 1/5 of the original lands are no longer able to support profitable farming and 1/3 of the remainder is impaired. Despite the great work of Dr. H. H. Bennett and his Soil Conservation Service, we are still pouring nearly ½ million acres of farm land annually into the Gulf of Mexico, our oceans or into our lakes. Yes, America is still rich, but when compared with our resources of even a few years back we are poor; and when we measure our present resources and assets against future needs we are poor indeed.

Can there be any question that pressures will develop by peoples within countries and between countries in their efforts to secure needed resources and to maintain and improve their standards of living? It seems clear that population increase, resources and markets on one side of the balance are not unrelated to economic crises and a possible welfare state on the other. Personal liberty and respect for the individual generally declines with over population where resources are inadequate to meet the needs of the people. People are not likely to fight for water or bread except when and where these are in short supply. Peace, progress, security, personal liberty and happiness of individuals and nations are possible only when natural resources are sufficient to supply basic needs and to enable people to enjoy a reasonable standard of living.

How Can We Develop and Retain A Satisfactory Resource Base?

To secure a satisfactory resource base two major steps lie before us and we must take both of these immediately:

1. We must cease and desist from our past wasteful extravagances and live within our resource income.
2. We must give effective support to both basic and applied scientific research as it relates to our natural resources and particularly to our renewable resources.

Brief discussions of each of these follow:

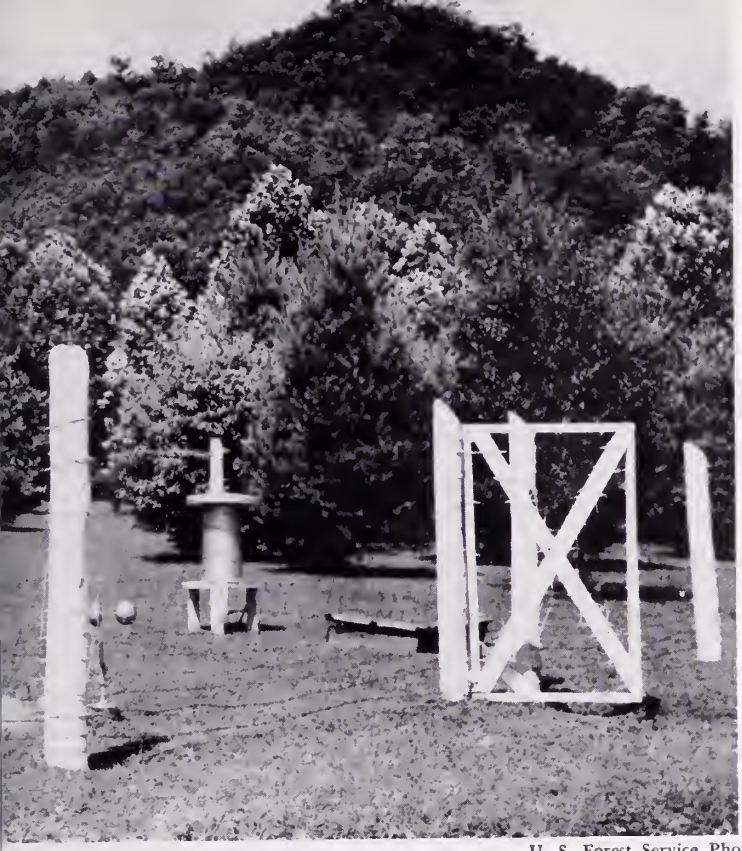
(1) Conservation must be made a part of the consciousness of all our people. We must more effectively "sell" the story and its importance to our people beginning with our youngsters in school, boy and girl Scout groups, religious youth groups, 4-H clubs, Camp Fire Girls and others. In some way we need to reach the key men in educational administration—the ones who determine policies, choose courses of study and initiate the writing of text books. New attitudes toward conservation can thus be gradually inculcated. Another point of great influence is in the educational training schools of our colleges and universities. Attitudes and points of view are often determined on this level. Teachers themselves need to be taught the need of wise use of resources

In order to develop and retain a satisfactory resource base, we must learn more about the causes and relationships of various land practices to our constantly falling water table. This small weather station in the

or they cannot teach our youth. They need to be given the facts and shown how to teach conservation and how it can be applied.

Our people have grown up under the delusion that our natural resources are practically inexhaustible and that America could feed the world. Consequently, our educational system has been painfully deficient. Until the basic facts and the philiosophy of conservation become a part of the consciousness of national and state legislators, governors, presidents and cabinet members and other chief administrators we shall continue to be in trouble and our natural resources will continue to receive more lip service than bona fide support. Until then it will continue to be bartered by politicians for political or personal advantage rather than to be wisely regulated by statesmen. America has had great statesmen but unfortunately it also has had too many faithless servants in high positions who stupidly, maliciously or inadvertently caused or permitted great destruction to our God given resources. I believe a better day may be dawning.

(2) Basic and applied research in those scientific fields pertaining to our natural resources—agriculture, soils, water, wildlife, fisheries, forestry, range management, wood technology, plastics, health, education, etc., etc., are probably of greater significance to our national and individual survival and well being than is the necessary, but at times quite unlimited, support given to the production of satellites and missiles or to the military or foreign aid or some other emergency that has caught us unprepared. Each of these major sources of administrative support is important and must be properly directed and financed. Still, would there be more national suffering or a greater injustice done to our beloved America if we were quickly obliterated with enemy missiles than if we should have our economic resource foundations drained out from under us? The latter already is occurring and I believe there is much too little recognition of this fact among most policy making leadership both nationally and on the state level. Perhaps we aren't reaching the right people. Government, too frequently, is little more than rule by emergency. Perhaps our



U. S. Forest Service Photo

Coweeta Hydrological Laboratory is a means of collecting much needed information for research on watershed management. Research in natural resources must be basic and applied.

security would be greater and we would have fewer emergencies if we had more advanced and objective planning (with pork barrels and log rolling removed) and if more adequate support were given sound research followed by development and management. To my mind this research is no less an emergency than is the preparation to meet a foreign foe. I believe we can best contribute to peace by building up our own resource security.

It is well to emphasize the fact that the shrinking of the once broad materials base of our industrial civilization makes us for the first time in our history dependent upon imports from foreign lands for materials essential for our technical organization. Thus far we have encountered no serious difficulty in buying materials needed. It would be unwise to expect that either a shooting war or a shift in a cold war would not change this. "We shall not remain truly free and powerful unless we compensate to the fullest possible extent, for lack of materials resources within our own borders."

It has been said that the most valuable undeveloped resource in the world is brain power. We must substitute intellectual resources for diminished materials resources. We must encourage a larger number of superior young scientists to tackle these natural resource deficiency problems. New and better methods of approach must be developed and we must find ways and means of substituting plentiful and cheap materials for scarce and expensive materials. We must find more efficient and lower cost ways of extracting necessary minerals, oils and other products from areas that are now not economical. The approach in developing plastics and synthetic rubber must be expanded so that other items in short supply can be replaced by something else that is equally as good or better.

We must remember that as population increases and society becomes more complex technologically it needs proportionately more and better trained professionals. This is as true in biology and resource management as it is in physics, engineering, mathematics or chemistry. While the population of the United States has doubled in the last 50 years, the number of its professionals has quadrupled. We now have 5 times more engineers and 10 times more scientists than we had a half century ago and yet these specialists are in short supply. With every forward step technologically a nation becomes more dependent upon research and brain power. And the more scarce a given resource becomes the greater the need for trained research and management.

Research must stress the basic or fundamental phases as well as the applied. Experience shows that advances in technology have almost invariably been slower when theoretical knowledge failed to move forward. Empirical methods cannot be used indefinitely in this scientific age.

Some Basic Resource Problems Needing Solutions

Perhaps, as a means of solving our diminishing resource problems this superior brain power needs to be used to awaken America out of its slumbering lethargy and give its people a greater sense of relative values. We must devise more effective methods of "selling" conservation to the public and particularly to our educators and to our elected officials. When this is a reality we shall have fewer worries about our security, our freedoms and our future.

A major need in the conservation and management of natural resources is more effective coordination in their administration and research. More team approach type of basic research is needed. Conflicting demands for land are most easily and equitably resolved when administration, management and research personnel have an understanding and an appreciation of the whole problem involved.

We need to know much more about the causes and relationship of different land practices to our constantly falling water tables and the relationships of these practices to soil moisture, temperature, and soil chemistry and the effects on crops and on the vegetative covering of the soil.

More basic data are sorely needed on the processes, causes, prevention and cure of erosion. We need to know far more about man-made causes as well as natural causes of erosion. The process and causes of sediment movement are not well understood. It is difficult to assess accurately and quantitatively the effect of a particular change in land use upon water and sediment in any given area of drainage. We still know too little about the movement of sediment or the movement of water in nature. The processes of sheet erosion under a forest cover are poorly known.

The basic field of soil-plant relationships needs much more scientific study and evaluation despite the fact that some $1,840,000,000 are spent annually on commercial fertilizers. We need to know much more precisely what elements are essential plant nutrients and what other elements are used and why. We also need much more precise information about the physiochemical processes by which growing plants assimilate nutrients.

Climate, although long recognized as a major factor in plant growth, has received little integrated attention from research workers. Relatively little is known about the interrelationships between water supply and plant growth. Much more precise data are needed on the relationship of temperatures and plant growth. A clearer understanding of plant processes may greatly expand the horizon of man's use of plants and enable him to make much greater use of abundant species presently of low economic value, particularly of most shrubs and trees.

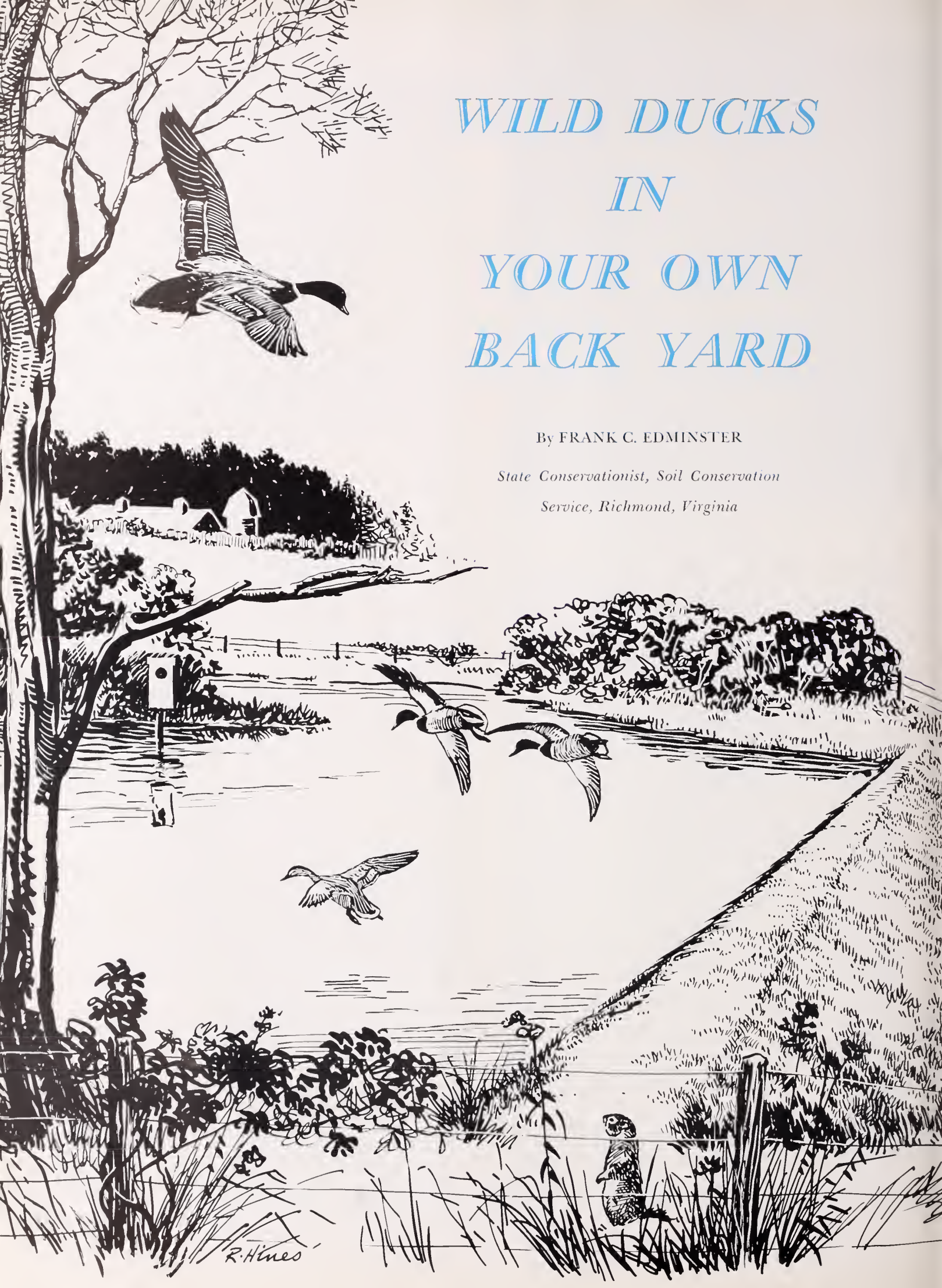
Basic research on population dynamics is urgently needed as a base for sound management of both wild

(Continued on page 23)

WILD DUCKS IN YOUR OWN BACK YARD

By FRANK C. EDMINSTER

State Conservationist, Soil Conservation Service, Richmond, Virginia



FAR FETCHED, you say, to have wild ducks in your own back yard? Yes, admittedly, that is stretching things a bit. But it is true that we can have waterfowl in places where they never have been before, and sometimes these places are very close to rural homes.

Many a Virginia farmer has been surprised to see wild mallards, wood ducks and other waterfowl on his farm pond. Built for an irrigation water supply, to water livestock, or for fishing and recreation, the thrills that come with visiting ducks on the pond are an added dividend. Furthermore, the 16,000 ponds built by Virginia land owners in their twenty-nine Soil Conservation Districts over the past two decades are having a marked effect on the distribution of the waterfowl population. These new water areas are also, in many cases, furnishing breeding areas for mallards and wood ducks. This helps bolster the supply of these birds that are so valued for sport and food.

Some ponds are more attractive to these aquatic birds than others. Where we wish to do so, we can design and build our ponds to be good habitat for them. More and more landowners who have had a taste of the pleasures of having wild waterfowl on their man-made water areas are building additional ponds especially for them.

We in the Soil Conservation Service have come to recognize two types of wildlife ponds—the "fish pond" and the "duck pond." Actually, this is an over-simplification since many ponds readily produce or harbor both fish and ducks as well as many other kinds of wildlife. But it is true that the ideal fish pond and the ideal duck pond are very different. Suppose we compare them.

A good fish pond may be in *any* location, is from a half acre to a few acres in size, has a small watershed above it, has mostly deep water and very little shallow water, has a moderate outflow of water even in periods of heavy rains, has a minimum of aquatic vegetation and maintains a stable water level.

A good duck pond is far enough from regular human activity to give the birds a feeling of seclusion, at least several hundred yards, is several to many acres in size, may have a moderate-sized or large watershed above it, has mostly shallow water, may have any amount of outflow, has lots of aquatic vegetation, and may be manipulated seasonally at two water levels if the flow is dependable.

The chart below summarizes these characteristics for quick comparison:

	Fish Pond	*Duck Pond*
Location	**Anywhere**	**Secluded**
Size	**Small**	**Large**
Watershed	**Small**	**Large**
Depth	**Deep**	**Shallow**
Flow	**Light**	**Substantial**
Aquatic Plants	**Minimum**	**Plentiful**
Water Level	**Stable**	**Two levels or stable**

Many ponds are in between these characteristics. The more closely a pond fits the "duck pond" specification, the more likely is it to attract waterfowl. But in addition to these elemental conditions, there are others that also strongly affect a pond's value for ducks. Proximity to a woods, a marsh or other ponds adds to its attractiveness. For wood ducks, a nearby woods is especially important. The type of soil under the pond and around it will strongly affect the vegetation. Generally, the more fertile the soil, the more lush will be the plant growth. The kinds of plants present will depend mostly on what species were in the vicinity before the pond was built but will be influenced by what may be planted by man or brought in by visiting birds and animals. The quality of the water is, of course, very important. It may be acid or alkaline, fresh or brackish, sterile or fertile. Lastly, the geographic location of the pond with respect to the natural migration flyways of the ducks and geese is important in determining how soon and how frequently they will find it.

If you wish to build a pond to attract waterfowl, all of these things should be kept in mind. If you now have a pond that fits the needs of the birds fairly well, there may be some improvements you could make that will make it still better. Some of these are discussed below.

A pond that is somewhat small can often be enlarged by heightening the dam, excavating the basin margins, or a combination of the two.

If the pond lacks shallows for growing duck foods this may be provided by grading a flat shelf around the pond edges. Its elevation should be such that it will be from zero to six inches deep at normal spillway level. Where the site will permit, a two-level water control arrangement can be installed. A two-foot removable extension on the outlet tube is one method; best is a concrete box drop-inlet with flashboards to adjust the water height. Under this system, the marginal shelf is graded level with or just below the low-water position. In summer, with the water at this level, a crop of millet or smartweed is grown on the shelf. In early autumn, with the seed crop matured, the pond is raised to the upper level so that the food area is flooded. This makes it readily available to the birds. In spring, the pond is again drawn down to the lower level.

Ponds to which livestock have access can be improved by fencing out the animals. Their water needs can better be met with a tank piped from the pond.

Where there is no protective cover close to the pond, plantings of trees and shrubs may correct this lack. A "landscaping" job around the pond with clumps of conifers and shrubs, and possibly a living rose fence, all behind a band of grass next to the water will add greatly to the wildlife shelter. This will improve the nesting cover for mallards and some other ducks. It will beautify the pond too.

If circumstances are generally favorable for wood ducks they may often be encouraged to nest right on the pond by erecting nesting boxes on poles over the water. Details of this box are available from the State Game Commission. Having these gorgeous birds raise a family on one's own pond is a prize thrill in wildlife management.

Landowners who are cooperators of Soil Conservation

(Continued on page 25)

STRENGTH THROUGH CONSERVATION OF NATURAL RESOURCES

By JOSEPH F. PECHANEC

Vast ranges of mountainous country such as this must remain covered by vegetation. It is this vegetative cover that allows life-giving water to seep into the soil for use by plant and animal life. The soil, water, plant

CONSERVATION, when applied to our natural resources, has been given many definitions. One I rather like is the one recommended by the American Association of School Administrators:

"Conservation of natural resources means the wise use of these resources for the greatest good of the largest number of people for the longest time."

Natural resources include the water, soil, plants, animals and minerals of our Nation. I shall confine my remarks to the renewable natural resources—the waters, the soils, the plants of our forests and ranges, and the animals—primarily fisheries and wildlife.

One of the major factors in the development of this strong Nation of which we are so proud has been its abundance of natural wealth. It was generously endowed with resources, but so were many other countries.

One needs only to go to some other sections of the world to be impressed forcefully with the fact that national strength is closely linked with wise use of natural resources.

I have been in the ruins of Persepolis in southern Iran. This was the royal city of Darius III, which was burned in a fit of anger by Alexander the Great in 331 B. C. Here the bases of the massive granite columns are buried in 5 to 10 feet of silt—silt that was washed from the mountainside above—a mountainside now of glistening rock. To almost any untrained eye it would appear that this mountainside had always been that way. Not so! Probably once forested, it was cut over. Flocks of goats, camels and sheep destroyed the subsequent cover of shrubs and grasses and left the soil exposed to the elements. The soil washed down and left the underlying rocks exposed. Now very little will grow. Waters from rain and snow that once trickled through the deep soil beneath the forest and appeared as sparkling streams for domestic and irrigation use now dash off the mountainside as flash floods heavily laden with silt. The mountainsides are virtually ruined and contribute little to national wealth. The dependent broad valley bottom, deprived of essential water, is also ruined and now inhabited largely by nomadic Bedouins with their flocks.

I have seen many other tragic examples of misuse of renewable natural resources.

The ruins of the ancient Roman city of Jerash in Jordan are now partially buried in 8 to 10 feet of wind-blown silt coming from the once forested mountain to the South and west of there.

The mountains of Lebanon, once covered with a forest of Lebanese cedar and other valuable trees, were ruthlessly cut during the time of Solomon. Subsequently grazed and burned, much of their soil was washed away. Now they produce neither trees nor much forage. Essential water is being lost through local floods.

In British, French and ex-Italian East Africa, a younger civilization has destroyed the forest, ruined the grasslands, and dried up the water courses. The lot of even the nomadic Somali is a hazardous one.

The Punjab, now a part of both Pakistan and India—an area of fabulously deep and productive soils — is sharply incised by tremendously deep gullies. The foothills of the Himalayas are deforested. The good forage plants on the hills near the far-famed Khyber Pass are long since gone. Restoration seems a hopeless and expensive task.

All of you know the present lot of the people living in these and other countries. National strength is completely lacking, even though national pride is not. Although there have been many contributing factors to the present lot of these people, one of the major has been the condition of the natural resources upon which man

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Mr. Pechanec is Director, Southeastern Forest Experiment Station, Forest Service, U. S. Department of Agriculture. An address delivered at meeting of the Richmond, Virginia Rotary Club on February 25, 1958.

Paul A. Moore, Tenn. Conservation Dept.

and animal life are so closely inter-related that what happens to one may affect one or more of the others. Conservation implies intelligent treatment of *all* natural resources.

is dependent for his requirements for food, shelter, clothing and the enjoyment of life.

These things may have happened here, even though our civilization is much younger. We were well on the way to having some similar situations.

Some of you may have heard of the alarming condition in the late 1920's near Salt Lake City in northern Utah. Here recurrent floods and mudflows rolled down the mountain and covered valuable farm lands and damaged settlements. One of these floods in 1930 caused a million dollars' worth of damage. All of this came from overgrazed mountaintops above the valley.

Some of you saw the deeply gullied farm lands of the Piedmont in South Carolina, Georgia, and elsewhere. Some of you also saw the widespread deforestation that occurred in the Lake States, the Northeast, and the South. Others of you saw the nearly complete extinction of some wildlife species.

Our water, soils, plant and animal life resources are not independent of each other. They are so closely interrelated that what happens to one may affect one or more of the others. For example, the deforestation mentioned before damaged also the soils, water, and wildlife resources. The gullying and loss of soil that occurred on farm lands in the Piedmont damaged water and wildlife resources.

The consequences of unwise use of our natural resources in this country were recognized by a few far-seeing individuals and organizations. Through their efforts a change in local and national attitudes began to take place. Much has been accomplished. Much more remains to be done.

With the increasing demands on our renewable natural resources that will result from the estimated doubling of the Nation's population by the year 2000 we need to examine carefully what we have and what needs to be done.

We could talk in terms of the Nation, but it might be even better to just look at the soils, waters, forests and wildlife of Virginia. The statistics won't be as big, but they will be plenty big enough. Since it is home to you it may be a more effective example than just talking in nationwide terms.

Virginia had an abundance of good soils, waters, forests, and wildlife. It still has, but there are many places that need concerted attention.

Our most important renewable natural resource—water—is the very lifeblood of this entire land. Based on annual precipitation, Virginia would appear to have plenty. But already stresses are appearing. Some municipalities are finding it difficult to meet the needs. Groundwater levels in some areas are dropping. Certain industries interested in locating in Virginia have chosen other locations because of the lack of adequate supplies of good quality water. Some of our rivers are ruined for many uses by pollution.

Water use is increasing markedly. In 1953 use in Virginia was estimated to be about 11 billion gallons. Within the last 25 years, use has tripled or even quadrupled. This trend will certainly continue.

What do we do? Build another reservoir? Drill another well? The solution is not that simple. There is no one practice that is the panacea. Action is needed on many fronts to bring about conservation of our water resources.

Among the many things that need to be done are the reduction of pollution; the efficient use of water in the home, industrial plant, or on the farm; the construction of small ponds; the construction of large dams for retention of peak flows; and many other practices.

In planning for the conservation of our waters let's not overlook the place that good land management has in improving quantity and quality of water. Good farming and good forestry practices reduce erosion and improve water quality. These same practices improve water storage of the upstream watershed, often at less cost than the storage provided by a reservoir behind a dam. Some striking figures from the Noonday Creek Watershed in Georgia show a cost of $13 per acre foot storage in the soil reservoir as compared to $47.50 in the nearby Altoona Dam and Reservoir.

If water is the lifeblood of our land, soil could be called our body. From it comes either directly or indirectly much of our food, clothing, materials for industry, materials for sheltering us, and other essentials to our daily living.

Virginia had an abundance of good soils—not as good as the black soils of the Corn Belt—but nevertheless very productive. During three centuries of occupancy some areas have been handled reasonably well. Others have been damaged pretty badly. The area in crop production is shrinking markedly, partly because of urban and industrial encroachment, but in a more appreciable way

because it no longer pays to farm the soils. Between 1948 and 1957 more than 2 million acres in Virginia went out of crop production. Nearly 1.3 million acres of this reverted to forest.

Some of these lands to the west of Richmond were so completely ruined that we cannot even grow good trees on them. They are troublesome local flood source areas. In their present condition they contribute essentially nothing to the economy of the Old Dominion.

Wise use of the remaining acres in cropland production is imperative. Using the soil according to its capability and best use, contour cultivation, crop rotation, and many other things can be done. Your Virginia Extension Service, your Vocational Agriculture instructors, the U. S. Soil Conservation Service have active programs to bring about application of better practices.

Virginia's forests, too, are a major resource. Once covering about 25 million acres, they were reduced markedly by conversion in part to a higher use for crop and livestock production, urban development, highways, and other uses. In 1948 our Forest Survey showed the acreage to be 14.8 million acres. As result of reversions from crop production this increased to 16.1 million acres in 1957.

The Old Dominion's forests contribute in a major way to its economy. It is estimated that the various forest industries contributed $650 million to the local economy, and employed one out of every five industrial employees.

Virginia's forest lands have been used hard. The Virginia Legislative Forest Study Commission report of 1956 and our Forest Survey of 1957 would indicate that much of the forest land is not producing more than a third as much as it can and should. The bulk of this deficient production is on the properties of the 211,000 small woodland owners—largely farmers—who own 81 percent of the forest land.

Here again there is much that can be done in the way of improvement and wise use. Your Virginia Division of Forestry, your Extension Foresters, the U. S. Forest Service, and others are striving to achieve these ends.

Wildlife and sport fisheries, too, are a very important resource. They contribute food and fur, and they have value in controlling rodents, insects, and destructive forms of animal life. Most important of all is the healthful recreation furnished by hunting, fishing, photography, bird-watching, and many other pursuits.

Hunting and fishing is big business in Virginia. In 1955 more than 360,000 hunting and 364,000 fishing license holders enjoyed the resources of the Old Dominion. It is estimated that they contributed $100 million to local economy.

With this resource, too, we have not done too well in the past. Progress is being made, and your Commission of Game and Inland Fisheries has done an excellent job.

Opportunities for outdoor recreation are not often mentioned in the list of renewable natural resources—even though implied. I think they deserve a specific place on the list.

With the increasing tensions of modern day living, and with the increased amount of leisure time afforded by the shorter work week, the opportunities to get outdoors and relax become essential to national health.

Outdoor recreation may not contribute as much monetarily to the income of the Old Dominion as some of the other natural resources mentioned. But who can place a value on the pleasure of seeing the rhododendron, dogwood, or pink bud in bloom? Who can place a value on the thrill derived from seeing the multi-colored carpet of fall colors of our mountain hardwoods? Or who can place a value on a picnic or two-day camp trip to a remote secluded mountain forest area?

Many people must enjoy these things, because during 1956 3.5 million visitors enjoyed recreation in the Shenandoah National Park and the Jefferson and George Washington National Forests.

In our quest for maximum water and timber production, and in other features of management of our soil and water resources, let's not get completely utilitarian and lose sight of the opportunities for outdoor recreation.

The many agencies I have mentioned already, and many others, are doing a good job. They need your interest and support. One group I have not mentioned and whom I would particularly like to congratulate are those who make up the Virginia Resource Use Education Council. I don't know how many of you are aware of the existence of this group. They, in cooperation with the Virginia State Department of Education, are promoting and improving conservation education in the Old Dominion. They have published the booklet "A Look at Virginia's Natural Resources." If you do not know of the Council or the booklet, I would urge that you become acquainted.

In this decade of Sputniks, ICBMs, hydrogen bombs, and other developments, it is easy to lose sight of other less dramatic items vital to our national strength. An abundance of good water, productive soils, forest and ranges, an ample supply of fish and wildlife, and good opportunities for outdoor recreation are essential to maintenance of this strong Nation.

Certainly, I would be the last to say that we must not move ahead as rapidly as possible in programs for national defense. But in strengthening our right we must not drop our left.

To achieve wise use of our renewable natural resources it is essential that everyone have an interest and help. It is not for just the farmer, the timberland owner, the forest industries, the educators, the state and federal public servants to do. It is just as vital to the banker, the insurance broker, the realtor, the mechanic and all others. In fact, it is everyone's business. You, as leaders in the various classifications of Rotary, can help materially by making it your business.

DID YOU KNOW?

A young whitetail deer weighs from three to five pounds at birth.

LOVE 'EM BUT LEAVE 'EM

By LYN HARRINGTON

WHEN you see a baby parked in its carriage, you don't immediately think: "Its mother has deserted it! I'd better wheel the carriage home and raise this child myself."

But every spring that sort of kidnapping goes on. Only it's with baby deer, not human babies. People out on a drive or a picnic come across a fawn by the roadside.

"Oh, the poor thing!" they say pityingly. "Its mother has forgotten all about it. Let's take it home, so it won't die of hunger or be attacked by other wild animals."

Usually the mother has simply been frightened by the approach of human beings, and is lurking amongst the trees wishing they would go away. But the well-meaning busybodies carry the fawn to the car, and take it home to city, town, or farm.

Then the trouble begins.

Often the fawn dies because it misses its mother's milk. Sometimes it lives, but in a sickly way, because it doesn't get the right kind of food. Sometimes it grows into a mature and quick-tempered deer, whose sharp slashing forefeet are dangerous to child or house pet. There is just no place for a deer in town or village, nor even on a farm.

I remember one deer that became a pet of the rangers at a forestry station. They fed it buns and sweets of different kinds. Then, of course, it wouldn't eat browse like its wild brothers. It had become a "bum," with a coat that was shabby and dull. Actually, the rangers' pet was dying of malnutrition.

The twin fawns we met at a logging camp were really orphans. Their mother had been killed by a logging truck, and the youngsters were being raised by a kindly woman in camp. They too developed unnatural appetites, and greedily waited for their all-day suckers.

"What will become of them?" I asked her.

"I'll keep them until after the hunting season, and then let them go free," the woman told me quickly.

But that too is a sentence of death to the little deer. By that time snow will lie on the ground and they will not know how to look after themselves. They have never learned to hunt their own food, nor to fear the wolf or cougar.

Over and over again the story of friendship between mankind and creatures of the wild ends in tragedy for the latter.

We met a man once who had made a pet of a wild fox. The fox learned to trust the old prospector and came every day to his cabin. That was fine. But the fox knew no other man. When a hunter came along, it wasn't afraid of him. The fox lost his life, and the prospector his pet, when the hunter's gun barked.

A cute roly-poly bear looks as if it would make a charming sort of live Teddy bear. However, even a cub has more strength than most of us guess, and it plays rough. A friendly little swipe from a cub can tear open the side of your face, or leave lasting claw marks on your arm. Then the pet has to be destroyed, or at best, chained up—not much of a life for a creature of the wild.

We heard of a boy who brought home four baby squirrels that he found in a tree. Two of the little squirrels soon died. The other two grew up to be perfect pests. They climbed up on curtains, scratched the piano, pulled things off tables, and hid things out of sight. Then one fell victim to the dog next door. The other fell from the housewife's shoulder as she was making soup, and was scalded to death.

You have sometimes heard of people who make pets of baby skunks. If they don't have the scent glands removed, the story is bound to have an unsavory ending. And even then, the pet doesn't adapt to house life. It still likes insects and eggs and forbidden foods.

A raccoon can be transformed into a delightful house pet quite easily, but it is very mischievous, by our standards, and becomes a thorough nuisance.

However, sometimes the story has a happy ending. One family in northern British Columbia had a half dozen Canada geese in its farmyard flock.

"Are you keeping them for a goose dinner?" we inquired.

"No, indeed," the farmwife told us. "We wouldn't want to, and besides, we wouldn't be allowed to."

The children had found the eggs after the mother goose had been killed, and brought them home.

"We hatched them out under a hen, just like chickens. But we've never clipped their wings, and they can fly away whenever they like. Even so, we had to get permission from the Game Branch to raise them, and the warden still likes to come around and count them over once in a while."

Only a few such permits are granted because game officials don't encourage people to make pets of wild animals or birds.

But the damage is already done by the time people get around to making application. For once human beings have handled a little fawn, the human odor clings. The mother fears the odor, and may refuse to have anything more to do with her offspring. Then it has no one at all to look after it.

It's a wonderful thing to have a tender and compassionate heart. And, of course, the creatures of the wild should be protected. But the very kindest thing you can do is to "touch not." Just be content to love 'em and leave 'em.

This article appeared in the July 25, 1956, edition of the *Christian Observer* and is reprinted with their permission.

When the shad and herring are running, large catches such as this are common along many of our tidal rivers and streams. The American or white shad offers a great deal of sport on light tackle and is highly esteemed for its delicious flesh and excellent roe. During the early part of the spawning run the males or "buck" shad are more numerous but later in the season the females or "roe shad" dominate the streams. Spawning occurs soon after the fish reach fresh water.

A favorite sport of many anglers is fishing for the hickory shad using light spoons and spinners. The hickory is a good fighter when hooked.

SPRING SH

Every year about dogwood time Virginia's tidewater streams, rivers and creeks come alive with millions of anadromous fish including hickory and American shad, and herring. These fish make their way from salt water to our fresh water streams and ascend the currents to spawn. During the fish runs anglers are busy trying their skill with hook and line as well as with dip and gill nets.

Sport fishing for hickory and American shad is becoming more popular each year. Favorite lures are small silver spinners or spoons.

Game Commission Photos by Kesteloo and Shomon

In the larger streams fishermen use drift or gill nets. Licenses for the use of drift nets can be obtained from the Commission of Fisheries, Newport News. For nets with 600-foot length and under the cost is $2.00.

After the day's catch the herring are sorted according to sex so that the delicious roe can be removed from the females.

At the peak of the herring run, tremendous catches can be made in the smaller streams. The net often is so full it must be dragged up the bank.

N. C. State Adv. Div.

To legally dip herring a dip net license must be obtained from the clerk of the county in which the dipping is done. Price of this license is $1.00.

D AND HERRING RUN

One of the major jobs connected with dipping herring is the cleaning operation after the day's catch.

Because of the large number of bones in herring they are seldom eaten fresh. Most herring are salted down for later use.

FISHING THE SURF

By WINSTON MONTAGUE

(Commission photos by Shomon)

It is not uncommon to fish all afternoon in the surf without a strike. In fact, this can go on for days but often just when a fisherman begins

THE OLD MAN was patiently mending his nets near famed Cape Hatteras lighthouse. He was busy then so he would be ready to use the nets after dark. "Why," I said, "don't you fish in the daytime instead of having to work in darkness?" "Son," he said, with an air of pity as if anyone should know about this, "the fish run to the beach at night and that's why we fish at night."

That day I learned something about surf fishing which has stood me in good stead ever since. Many salt water fish DO come to the beach at night. It will help you a great deal in surf fishing if you remember this. A friend, Ralph Gray, who is a professional guide at Hatteras, likes to catch drum in the surf. He likes to fish after dark for he knows from years of experience his chances of a good catch are better then.

Many a time I have fished all afternoon with never a strike and then between sundown and dark caught fish in the surf rapidly. The tide has much to do with your success in the surf but if you fish the surf from daylight to sunup and sundown to dark, and after dark, you are almost certain to catch some fish.

My experience has been the best time for surf fishing is from the time the tide is about three-quarters flood until about an hour after it has turned. If you can catch this period about sundown or early in the morning you should have excellent luck.

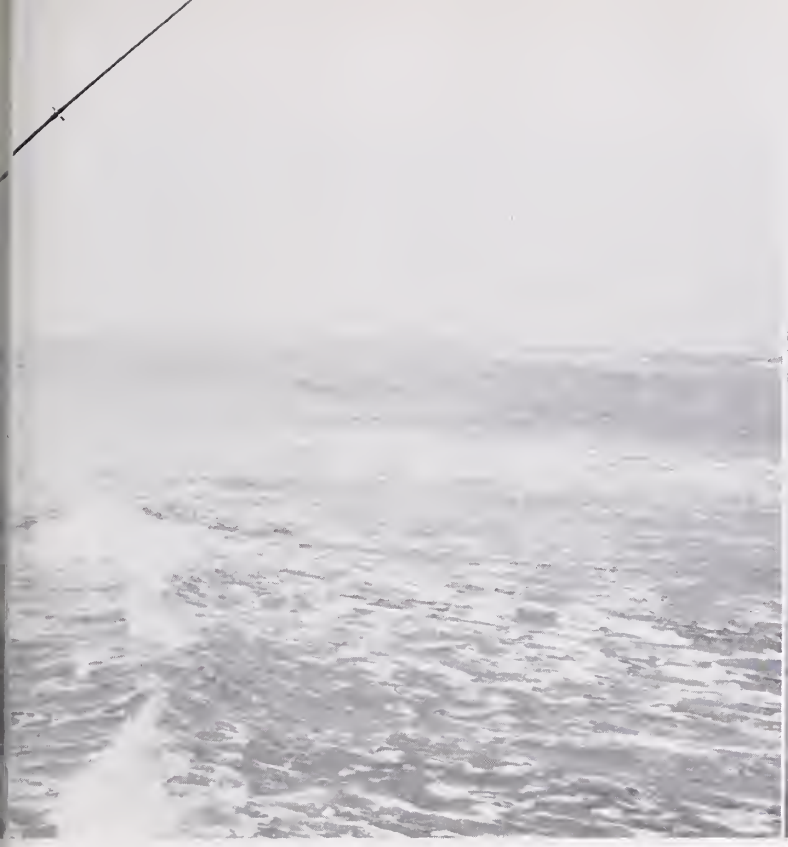
If you are a novice you will probably want to know what kinds of fish you may expect to catch in the surf and where and when to fish for them. This article will be confined to the beaches of Virginia and North Carolina and discuss only elementary things about surf fishing. North Carolina is included because while we have some excellent surf fishing in Virginia many of the best places are difficult to reach. Richmonders, for instance, can get to Hatteras with perhaps less effort than they can to many of the best places on our own Eastern Shore. The coastline on the Eastern Shore of Virginia, where we find the best fishing, is separated from the mainland by large areas of water and marshland. You must go by boat there whereas you can drive your car to within a few feet of the ocean on miles of the Carolina coast.

Almost all of the Virginia coast off the Eastern Shore furnishes good surf fishing once you get there. Cobb and Wreck Islands, off Oyster, Parramore and Cedar Islands, near Wachapreague, and Assateague Island, near Chincoteague, are all well-known spots for the Virginia surf fisherman.

In North Carolina the beaches at Hatteras are perhaps the most famous but you will find plenty of anglers in the surf at Nags Head and Kitty Hawk, Ocracoke Island, Drum and Topsail inlets, Carolina Beach and in fact all up and down the Carolina coast.

What will you catch? This depends on many things: when and where you fish, the kind of bait you use, and so on. Generally speaking, Virginia and North Carolina surf anglers hope to catch channel bass and bluefish but they may catch anything from spot to shark. You probably will catch some kingfish, sometimes called whiting, and you may pick up some sea trout and flounders. In the early spring you are almost certain to catch a lot of skates — which you will not want. In some places in Carolina you have a good chance to get some big mackerel and you might pick up a pompano.

What you catch depends a good deal on the kind, and especially the size, of the bait you use. I am referring to natural bait. For channel bass you would normally use a larger bait than you would for bluefish. If you want a



to be disgusted with the endless sand beach and the pounding surf, lady luck appears on the scene.

Landing a fish like this in the surf is worth a lot of patient waiting. It is a thrill that will remain with the angler for the rest of his life.

kingfish, spot, flounder or pompano, use a small bait. With the small baits, however, your chances of getting a forty-pound drum are just about nil.

Fishing for channel bass is something like deer hunting: you do not get one every time you go out. Some men like to use two hooks and bait one with a big chunk of bait for old Brother Drum while on the smaller hook they use a small bait so they are ready if a small fish comes by. This gives you the advantage of being ready for the drum if he comes and yet having the sport of catching some smaller fish while waiting. Frequently this method provides you with an interesting day when otherwise you would have gone fishless.

Sometimes you can compromise and use a bait which is not too large for a blue yet big enough to interest Brother Drum. The big trouble with trying for both species with the same bait is that you will be wrong with the size of your hook. The hook for channel bass is too big for most blues and the hook just right for Mr. Bluefish is too small for a good sized drum. It is better to use two different hooks and put the right sized bait on each for the fish you hope to catch.

There are many natural baits just as there are a variety of artificials for surf fishing. To some extent, the bait you use determines the kind of fish you catch. Day in and day out, you won't go far wrong if you use either mullet or a piece of bunker, often called menhaden. Cut off a strip the size you think would tempt the fish you hope to catch, put it on your hook and await developments. If any fish are around chances are one will soon find it.

In some places on Virginia's Eastern Shore they fish for drum with peeler crabs, using a whole small crab or half a large one. This is good bait and I have caught quite a few with it. Some men use clams and I have heard of oysters being used though these are hard to keep on the hook. If you stick to mullet and bunkers, however, over the long run you will catch as many as anyone else. Many of the old-timers at Hatteras will tell you salt mullet is the best bait but my own preference is for fresh bait every time.

Blood worms will catch fish in the surf. So will peeler crabs. Squid is also good. And if you want to catch a pompano try a sand flea, the little creature that burrows down in the sand when waves go back from the beach. If you are quick you can scoop them up just as the water recedes. Take up an inch or so of sand and chances are you will catch one or more though in some spots they seem more plentiful than in others. Put the sand flea on the hook, shell and all. All kinds of small fish like them and pomano are especially fond of these little critters.

Bird hunters do not expect to find birds everywhere but through experience learn where to look for game. So it is with surf fishing. You don't just throw in your line and pull out a fish. There are places where fish feed and places where few fish can be caught. You must learn to recognize the feeding spots if you would be successful. Generally speaking, surf fish feed in holes and sloughs, the sloughs being under water trenches or ditches running about parallel to the beach. Currents running up and down the beach carry food to these holes and sloughs and that is why fish hang around them. A flat bottom gradually running out to deep water is usually not productive of good fishing but when you find a spot with deep sloughs or holes on the bottom you will usually find fish. These places gather food and where the food is there the fish will be.

(Continued on page 24)

Game Commission Photos by Kesteloo

Piedmont offers many miles of fishing streams in the form of partially tidal waters to shallow rocky streams such as this one. Three major river systems occur in the region.

Many public impoundments, managed by the fish division of the Commission of Game and Inland Fisheries, are available to anglers in the Piedmont section of the Old Dominion.

Fishing in Virginia's Piedmont

By N. R. BOWMAN AND D. L. SHUMATE, JR.

Fisheries Biologists

PIEDMONT is usually considered as the upland portion of land east of the Blue Ridge Mountains extending from the Hudson River to northern Alabama. In Virginia it is generally classified as that area located between Washington, D. C., via Richmond and Greenville County west to the foothills of the Blue Ridge. This Old Dominion region is characterized by rolling hills, valleys, and moderately moving rivers and streams.

The Piedmont is crossed by three major river systems and a fourth river forms the northern boundary. The rivers and their tributaries vary from deep, partially tidal water to shallow, rocky streams, and offer a variety of fish. In addition to these, many large lakes and ponds are available to the anglers.

Lake Brittle, a 75-acre impoundment owned by the Commission, is located in the northwest section of the Piedmont near New Baltimore, Virginia. Because of its accessibility to the Washington-Alexandria area, the lake is heavily fished for largemouth bass and bluegill. Year-round fishing is permitted and boats and live bait are available.

The Rappahannock River, located south of Lake Brittle, offers a variety of fish including smallmouth bass, crappie, sunfish, catfish and carp. Through contacts with local game wardens or fishermen, access points to this stream can be found. It also offers opportunities for float trips, wading and bank fishing and is an excellent stream for canoeing.

The Rapidan River, a tributary of the Rappahannock, flows through Madison and between Culpeper and Orange Counties and offers fair largemouth bass fishing plus good smallmouth, bluegill, crappie, carp and catfish angling. This stream can best be fished by wading or angling from the bank.

In Albemarle and Fluvanna Counties the Rivanna affords good fishing for smallmouth bass, sunfish and catfish. Another area of great interest in this section is Fluvanna Ruritan Lake, a Commission impoundment of approximately 70 acres, stocked with largemouth bass and bluegill. Rental boats are available and private craft can be launched in the lake. The North and South Anna Rivers and the Little River northwest of Richmond offer excellent panfishing for bluegills, sunfish and an occasional largemouth bass.

Virginia's largest river, the James, offers the bass fisherman excellent smallmouth fishing from west of Lynchburg to Bosher's Dam above Richmond. Other anglers spend their time on this stream fishing for channel catfish, which grow to a large size. Chain pickerel are found in some of the tributaries of the eastern section including Deep Creek and Willis River.

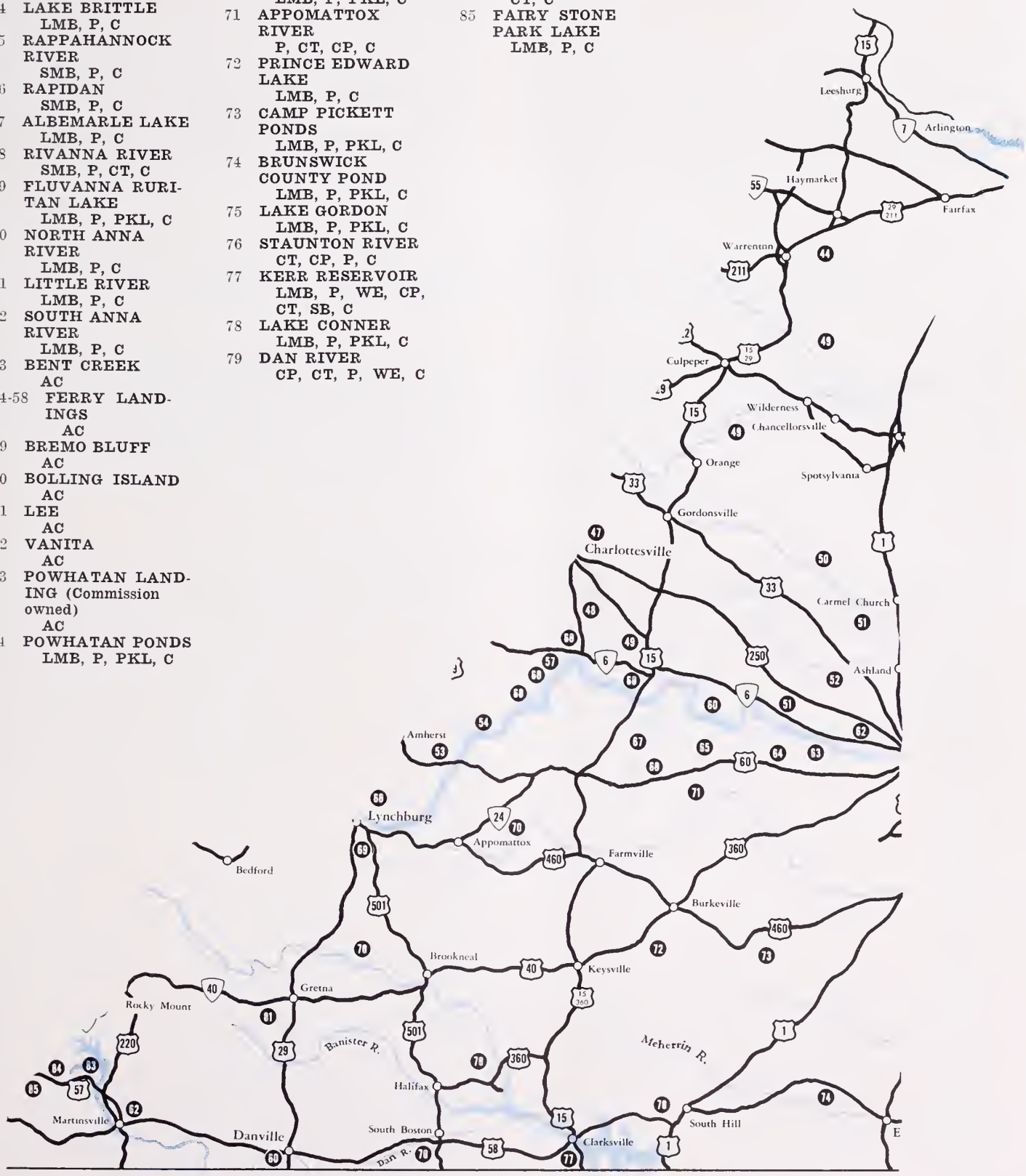
Launching sites for small boats can be found at Bent Creek, Bremo Bluff, Bolling Island, Lee, Vanita, the Commission-owned public landing in Powhatan County and several old ferry landings in Fluvanna, Albemarle

(Continued on page 24)

LEGEND

AC—James River Access Site
BT—Brook Trout
C—Crappie
CP—Carp
CT—Catfish
LMB—Largemouth Bass
P—Panfish (Sunfishes)
PKL—Pickerel
RT—Rainbow Trout
SB—Striped Bass
SMB—Smallmouth Bass
WE—Walleye

44 **LAKE BRITTLE**
LMB, P, C
45 **RAPPAHANNOCK RIVER**
SMB, P, C
46 **RAPIDAN**
SMB, P, C
47 **ALBEMARLE LAKE**
LMB, P, C
48 **RIVANNA RIVER**
SMB, P, CT, C
49 **FLUVANNA RURITAN LAKE**
LMB, P, PKL, C
50 **NORTH ANNA RIVER**
LMB, P, C
51 **LITTLE RIVER**
LMB, P, C
52 **SOUTH ANNA RIVER**
LMB, P, C
53 **BENT CREEK**
AC
54-58 **FERRY LANDINGS**
AC
59 **BREMO BLUFF**
AC
60 **BOLLING ISLAND**
AC
61 **LEE**
AC
62 **VANITA**
AC
63 **POWHATAN LANDING (Commission owned)**
AC
64 **POWHATAN PONDS**
LMB, P, PKL, C
65 **DEEP CREEK**
PKL, P, CT, C
66 **BEAR CREEK LAKE**
LMB, P, C
67 **WILLIS RIVER**
PKL, P, CT, C
68 **PEDLAR RESERVOIR**
LMB, P, BT, C
69 **LYNCHBURG COLLEGE POND**
LMB, P, C
70 **HOLLIDAY LAKE**
LMB, P, PKL, C
71 **APPOMATTOX RIVER**
P, CT, CP, C
72 **PRINCE EDWARD LAKE**
LMB, P, C
73 **CAMP PICKETT PONDS**
LMB, P, PKL, C
74 **BRUNSWICK COUNTY POND**
LMB, P, PKL, C
75 **LAKE GORDON**
LMB, P, PKL, C
76 **STAUNTON RIVER**
CT, CP, P, C
77 **KERR RESERVOIR**
LMB, P, WE, CP, CT, SB, C
78 **LAKE CONNER**
LMB, P, PKL, C
79 **DAN RIVER**
CP, CT, P, WE, C
80 **CITY OF DANVILLE**
WE, CP, CT, P, C
81 **LAKE BURTON**
LMB, P, C
82 **CITY OF MARTINSVILLE**
LMB, P, C
83 **SMITH RIVER BELOW PHILPOTT**
BT, RT
84 **PHILPOTT RESERVOIR**
LMB, SMB, P, CP, CT, C
85 **FAIRY STONE PARK LAKE**
LMB, P, C



VIRGINIA'S DEER HERDS INCREASING

Latest tabulation on Virginia's deer, bear and wild turkey kill for the 1957-1958 season just ended

By CHESTER F. PHELPS

Chief, Game Division

AGAIN the statewide deer kill shows the phenomenal pattern established in Virginia during the past decade—a steady increase in the take of whitetails. In fact, a new all-time record has been set for the state—a total of 22,473 deer taken for the season, the largest in the history of the Commonwealth. It is interesting to note that 208 animals were taken by bow and arrow.

This increase took place despite one factor that failed to meet the expectations of game biologists. The deer kill west of the Blue Ridge, which usually accounts for most of the steady increase, fell somewhat short of the previous season. The deficit, however, was more than made up by the substantial increase in the kill east of the Blue Ridge, principally because of more liberalized regulations in a number of counties, a situation requiring doe deer to be taken because of an over-population of deer.

Had the deer harvest west of the Blue Ridge been greater, which would have been the case had the better weather prevailed, the kill might have gone to 25,000 or better.

The kill west of the Blue Ridge, however, which contributes about half of the state total, decreased from the preceding year by 585. In the mountains, with a season of only six days, weather can be, and was, an important factor. Normally, hunting pressure, and consequently the kill, is highest on the first and second day when most sportsmen try to get out and on the last day when hunter-choice deer shooting is permitted in many counties.

Opening day west of the Blue Ridge was characterized by rain and fog at the higher elevations. The following day began with rain and heavy winds, again discouraging hunter activity. The last day, Saturday, brought a snow belt to most of the range and blizzard conditions in some sections. Undoubtedly, adverse weather reduced the har-

Big Game and Turkey Kill

County	1955–56			1956–57			1957–58		
	Deer	Bear	Turkey	Deer	Bear	Turkey	Deer	Bear	Turkey
Accomack	7			9			19		
Albemarle	93	1	53	83		43	91	1	42
Alleghany	221	2	79	288	2	22	360	7	32
Amelia	72		116	66		133	80		94
Amherst	59	4	10	53	10	13	67	8	16
Appomattox	63		73	53		33	91		39
Augusta	662	25	84	1,028	19	78	1,187	78	53
Bath	928	12	236	1,528	1	187	1,351	2	156
Bedford		2	11		13	7		11	8
Bland	35	4		32	4		57	5	
Botetourt	156	10	15	232	14	23	301	8	10
Brunswick	40		69	24		67	40		47
Buckingham	316		173	274		121	382		104
Campbell			25	17		24	6		10
Caroline	939		115	1,248		98	1,671		91
Carroll	10			10			9		
Charles City	491			566			503		
Charlotte	12		64	14		70	8		32
Chesterfield	107		83	99		100	102		47
Clarke	23			35			62		
Craig	282	6		402	1		447	6	
Culpeper	72		24	55		17	253		22
Cumberland	86		95	97		34	157		47
Dinwiddie	100		109	96		114	172		85
Essex	124		8	155		8	134		6
Fairfax			7			11	10		11
Fauquier	58		37	53		34	92		18
Fluvanna	42		30	53		32	54		31
Frederick	567		42	1,068		45	833		19
Giles	223			365			385	4	
Gloucester	39			49			36		
Goochland	49		33	44		18	54		22
Grayson	242			373			273		
Greene	8			13			15		
Greensville	52		29	60		22	86		30
Halifax	96		96	75		78	300		71
Hanover	51		23	40		14	132		11
Henrico	24		42	24		6	34		10
Highland	213	1	61	427	2	74	366	3	43
Isle of Wight	63		4	100			116		5
James City	368		21	523		8	527		11
King George	73		14	95			310		
King and Queen	193		18	173		20	184		12
King William	279	1	21	256		29	266		8
Lancaster	39			34			48		
Lee	21			18			19		
Louisa	70		40	53		39	75		33
Lunenberg			32	12		26	16		38
Madison	6			3			7		
Mathews	33			30			24		
Mecklenburg	6		38	10		37	11		36
Middlesex	16			23			18		
Nansemond	160	25	2	224			190	3	7
Nelson	71	10	42	65	22	4	54	25	30
New Kent	325		31	478		51	430		25
Norfolk	379	22		529	5		633	1	
Northumberland	34			23			39		
Nottoway			34	38		38	37		30
Orange	57		71	52		54	223		54
Page	131	5	7	334	5	1	408		14
Patrick							67		
Powhatan	91		63	83		61	101		44
Prince Edward	26		55	11		31	15		41
Prince George	219		58	414		79	426		60
Princess Anne	14			16			6		
Prince William	9		36			67	78		51
Pulaski	2			2			4		
Rappahannock	14			32			20		
Richmond	47			63			68		
Roanoke	12			18			21		
Rockbridge	153	11	54	228	9	39	292	19	47
Rockingham	469	8	27	896	22	20	822	23	19
Russell	7			5			5		
Scott	106			96			216		
Shenandoah	1,052	4	43	2,817	1	22	2,175	1	38
Smyth	692	3		505	3		345	1	
Southampton	398		34	581		24	666		21
Spotsylvania	78		95	80		105	266		61
Stafford	95		25	101		58	314		44
Surry	243		48	270		60	317		60
Sussex	166		56	253		57	264		54
Tazewell	42			22	2		45	2	
Warren	158			385			400		
Warwick	348		1	216			335		
Washington	97			156			135		
Westmoreland	46			36			55		
Wise	98			65			248		
Wythe	87			117			99	5	
York	569		12	1,182		14	819		10
County Total	14,227	156	2,797	20,861	135	2,470	22,473	213	2,060

vest and was especially influential during the final antlerless day. Statewide, or broken down into east of the Blue Ridge and west of the Blue Ridge, the kill ratio of bucks to does was approximately 66 percent bucks and 34 percent does. Informed sportsmen, who realize that the future of the state's deer herds and their hunting lies in a proper harvest, know this is an excellent beginning but should not be considered the optimum. In Massachusetts, for example, where there has been a "hunter's choice" season since 1910 and where hunting pressure is twice that in Virginia, the harvest has more than doubled since 1910. A sex ratio of 54 percent bucks and 46 percent does is harvested. Actually, this has been done on a smaller scale in Virginia, as Essex, King & Queen and Caroline Counties have been shooting "either sex" deer since 1952 and the harvest has either remained stable or increased.

The statewide kill of bear also increased but the significance of this is still uncertain. Since there is no known means by which game biologists can accurately age bear, it is not known whether hunters are taking a larger percentage of the few bear left or harvesting an apparent surplus. It does appear that the bear population is more vulnerable to hunters in the years when food is plentiful, as was the case this season. Until more is known of the bear a conservative policy and attitude toward hunting this splendid big game animal should be followed.

The number of wild turkeys checked throughout the state declined to the lowest figure in recent years. While the decline followed no particular pattern biologists feel the situation is more alarming in eastern Virginia than west of the Blue Ridge. The turkey is a bird of the mature, mixed hardwood forest and the converting of many thousands of acres of eastern woodland to pine, coupled with selective cutting of mature hardwoods, is taking an increasing toll of our largest game bird.

HAWKS AND OWLS NOW PROTECTED

At long last Virginia has joined 42 other states in protecting the hawks and owls. Through the efforts of conservation-minded individuals and the Virginia Society of Ornithology, the 1958 General Assembly enacted into law Commission-sponsored House Bill 108 which places the eagle on the protected list and gives protection to hawks and owls, except when found doing damage.

Over the years many citizens of the Old Dominion have killed untold thousands of these birds. Of the 15 species of hawks and 10 species of owls which we have, only three species are known to damage poultry, small birds and animals. By weighing the evidence for and against these destructive species, the results show that they do a great amount of good in the state by destroying thousands of rodents each year.

Previous hawk laws failed to pass in the Legislature because they were worded in such a way as to protect some owls without protecting others. The argument against this type bill was that, generally speaking, the only people who could distinguish between the various species were those who wouldn't shoot them in the first place. In addition to the wording of the bill, there were too many people in Virginia who were not familiar with the facts involved. They had no idea of the large numbers of these innocent birds killed each year and therefore were not interested.

As the new regulation goes into effect, all species of hawks and owls will be protected by state law. The law enforcement division of the Commission will have the authority to apprehend a person for the needless killing of one of these birds. Of course, if a hawk or owl is destroying poultry, the landowner is permitted to destroy the bird inflicting the damage.

Conservation people and bird lovers feel that Virginia now has one of the best laws in the country for protecting these birds of prey. The people of Virginia should feel proud that our lawmakers have set an example by adopting this law.

Things You May Not Know

Wild turkeys often hiss like a snake to discourage predators from taking their eggs.

We have two species of wild swans that are native to the United States. These are the whistling swan and the trumpeter swan.

A major difference in the physical structure of the dog and the wolf is the pupil of the eye. The wolf has an oblique pupil while the pupil of a dog's eye is round.

The common crayfish has a unique body structure with its liver located in the head and its teeth in the stomach.

It has been estimated that guinea pigs have a sense of taste one thousand times stronger than man.

River otters shake vigorously and roll over in snow or grass to dry themselves after a swim.

WILDLIFE RESEARCH

Often Criticized, Bringing Results

By ROGER LATHAM

Outdoors Editor, Pittsburgh Press

WILDLIFE management is a real science and most of the technically trained men in the profession today have had five to eight years of university schooling. This is roughly equivalent to that required for other professional men, such as lawyers, dentists, doctors, chemists and engineers, to whom we take our problems in confidence.

But the wildlife profession is much newer than the others and has not yet been accepted in the same faith. The game and fish manager has had to change his ideas, his recommendations, and his policies many times during the last quarter century because of research and changing conditions. Perhaps for this reason sportsmen are often heard to say, "They don't know what they're doing." But the fact that they are making progressive changes really proves that they do know what they're doing, and that they are intelligent scientists after all.

Because of the rapidly changing pattern of this new science, with its many "growing pains," sportsmen are slow to adjust to the new and different ideas presented by the game manager. Many still say that "in the good old days" there was more game and they believe that we should go back to, or stay with, the ancient game management methods in vogue at that time. Of course, they evade the truth revealed by actual figures and turn a deaf ear to facts about changing conditions. Sure, hunting for certain things (rabbits, quail and grouse mostly) was better for the individual hunter in those days. But today the pressure is almost a hundred times as great on our game supply as it was prior to World War I and even though the figures show the total kill is much greater today, the amount of game per hunter dropped.

A comparative handful of hunters in those days had things pretty much to themselves. When you went hunting, you walked or drove a horse and buggy and you had little or no interference from the "city hunter." Now almost anywhere you go, the country is over-run with hunters. Then, too, in those days posted property was almost unknown, but today a good percentage of the farmland is closed to hunting. This means the same hunting territory and the game on it, which was enjoyed by one man in 1910, is now being shared by 50 or 100 or maybe 200 men.

More Game is Available Now

In that day, too, the farms were small, with plenty of brushy wood lots, weedy fields, thick fence rows, and other good cover for rabbits and quail. Today those farms are often as clean as a plate; the fence rows are gone, and the crop fields are weedless from repeated mechanized cultivation and spraying with herbicides. Even the bugs formerly eaten by quail are killed by spraying with poisons.

And the ridges and mountains of that day were full of cottontails and grouse because the forests had been newly cut and the whole state was one huge "slashing." This was ideal for those two game species but grouse and rabbits today are comparatively scarce in our forests simply because the trees grew up and the low ground cover largely disappeared.

But in spite of these changing times and changing conditions, there are many times more deer (kill in 1907 was 200; kill in 1957 about 125,000), many times more wild turkeys, more squirrels, and still a good number of rabbits and grouse. And there are ringnecks where there were none at that time.

Many sportsmen will remember how game management went through a whole series of steps in its evolution from an art to a science. Fifty years or more ago, the answer to greater abundance of game was protective laws and regulations.

But the men in charge soon found out that reducing the bag limits of cottontails or quail from eight to four, or closing the season altogether, didn't produce great quantities of these game animals on farms where all the cover had been removed in "clean farming." And closing the season on wild turkeys or squirrels didn't help if the forests were cut and nothing was left except stumps and brush.

Food and Cover Prime Essentials

The next step and the supposed solution to all problems was the refuge system. But again experts found out that refuges did little good where food and cover are lacking because there was no game there to use the refuges. And they found out that hunting pressure was not the cause of game scarcities in many cases anyway.

Then came predator control with much the same result. Where living conditions were not suitable for game, killing predators did no good, and where conditions were good, killing predators was not necessary.

And, finally, game farms and stocking were believed to be the answer to all game scarcities. But this idea followed exactly the same pattern. Where the habitat

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was poor, it did no good; where food and cover were right, it wasn't necessary or even desirable.

Most progressive states have long since relaxed their hunting regulations where studies have shown that it could be done, and Pennsylvania has made considerable progress in this respect but is still considered quite conservative. Most states long ago abandoned their refuges except for certain specialized purposes. Wild turkeys, waterfowl and some very scarce kinds of game can still benefit from refuges. But they seem to have little or no value for rabbits, pheasants, grouse, quail, squirrels, deer, etc., in Pennsylvania.

Again most progressive states have thrown out, or are in the process of throwing out, their bounty systems because they have found that these accomplish little in the way of predator control and, consequently, practically nothing in game saved for the hunter. And these same progressive states are closing their pheasant and quail farms and using the money formerly spent on propagation, and for the purchase of rabbits and other game, for habitat improvement work instead. And their hunting kill has gone up, not down.

The story of restrictive hunting regulations, refuges, predator control, game stocking, and land management (food and cover development) is the history of game management in a nutshell.

SCIENCE AND RESOURCES (Continued from page 7)

and domestic animals. Biological studies on density phenomena, community interactions and stress factors are sorely needed.

Research to determine the mechanisms resulting in the formation of rain would enable a sound approach to be made to the problem of weather modification. Under present conditions only empirical and unscientific approaches can be made. Likewise we need a cheap process of converting sea water into fresh water for communities, agriculture and industry.

Forest genetics research like many other lines of plant and animal breeding should certainly be stressed as it seems almost certain this would greatly enlarge our resource base.

As our population expands and our resources further decline we shall surely have to rely much more heavily on the sea for food and for many other resources. We need to know much more about how specific chemical characteristics of sea water affect its fertility. We must know much more about what substances and other conditions inhibit or produce growth of marine organisms.

Science needs to give us an effective blueprint of procedures for deriving better multiple purpose benefits from more of America's public and private lands. For example, we need far better procedures of how to best integrate sound wildlife management into profitable agriculture, forestry and grazing programs. We also need more knowledge of how different land practices affect different wildlife populations. Specifically, we need to know much more precisely the effect different soil conservation practices have on different species.

Basic research on environmental relationships of the entire biological community is greatly needed. We must know very much more of the inter- and intra-species relationships under differing conditions such as population densities, various land use practices and climatic or weather conditions.

The broad subject of plant and animal control and the effect control agents have upon man, the soil and its organisms and on all domestic and wild animals that live on the land is in sore need of careful evaluation. Likewise intensive studies of disease, nutrition and pathology are urgently needed on our native and introduced flora and fauna.

We need basic studies of the value and limitations of our wetland resources and of how they can best be managed in the public interest. In the field of recreation we must devise better means of getting more enjoyment and relaxation out of smaller and smaller per capita space for tourists and sight-seers and smaller home-take for more fishermen and sportsmen. Last year some 59 million people visited our national parks, 52½ million visited national forests and 7½ million visited national wildlife refuges. Of 12 year olds or older nearly 21 million went sport fishing and nearly 12 million went hunting last year.

A Current Science Peril

The above are but a few illustrations of a great many fields of research into our diminishing resource base that are calling loudly for scientific answers. In the main these studies are largely biological. It is almost frightening to realize that government on the federal level devalues or at least apparently does not realize the need of giving support and encouragement to scientists and other workers in these biological professions. In 1954 a federal law was passed which permits the Civil Service Commission to adjust rates of pay in those fields where the supply of professional personnel is not adequate for the demand, where sufficient eligibles therefore cannot be secured for what are considered as essential jobs in government. Recently the Civil Service Commission ruled that personnel in specified categories would be moved to the top of their respective grade. These include professional engineering, architecture, physical administration, physics, electronic research and development, chemistry, metallurgy, geophysical exploration and development, mathematics, and certain technological specialties such as rubber and plastics, food processing and packaging. Only those biologists and basic resource specialists are included whose specialities place them in the chemical areas. Liberalization in reallocations for higher positions and pay has also at times, I believe, been given workers in those favored fields as a further means of competing more favorably with private industry.

It seems to me such policies encourage the most outstanding resource scientists to leave government and their work on renewable resources regardless of how essential such personnel are in their specialities. Such discriminatory favoritism implies low value on professions outside the favored categories and it surely will discourage superior students from entering those fields. Discriminatory rulings and preferential pay for comparable service are bound to create unfavorable employee relations in government and particularly where technicians and scientists are working as a team on resource research and management. This preferential treatment has a tendency to assign more and more of the responsibilities of the scientists in the non-favored fields to specialists in the favored categories, thus diminishing the quality of team research that should be performed. More importantly the present trend seems to me to indicate a profound lack of understanding and appreciation of the importance of basic resources in America.

In conclusion I cannot too strongly emphasize the profound importance of a scientific approach to the manage-

ment of America's resource base. Constantly changing conditions always will require new information and new techniques to meet new problems. While there is an urgent need for more effective coordination among federal and state agencies administering our basic resources there is perhaps still greater need for more effective research and deeper digging. Unless our resources are managed more scientifically and more fresh brain power is applied to our resource problems America most assuredly is headed toward being a have-not nation. Our security, our progress and our freedoms are clearly at stake. "Without vision the people perish!" Are we equal to the challenge already upon us?

FISHING THE SURF

(Continued from page 17)

Those who are experienced surf men can spot the likely places by watching the action of the waves. If the waves come well up to the beach before piling up and breaking chances are there is a slough or deep hole near the beach. If they break well off-shore there is usually a sand bar there. Sometimes just inside this bar produces good fishing. If you do not know what to look for the best bet is to watch where others fish and try that general vicinity.

Sometimes a place will furnish sport at low tide and not amount to much at high water. Usually the incoming tide makes the water deeper in the holes and sloughs near the beach, causing good currents through these spots, and then is when you should get your best fishing.

A common fault of novices at surf fishing is trying to cast their baits as far as possible from shore. Newcomers to the sport frequently proceed on the theory the deeper the water around their baits the better their chances. This is not necessarily so. While it is sometimes advantageous to get out far, as, for instance, when trying to get just inside an off-shore bar, it is best as a general proposition to stay close in. Try to fish just behind where the waves are breaking and day in and day out you will catch more fish than the fellow who heaves his bait out as far as he possibly can. Some of the best fishing I have ever had has been within fifteen or twenty feet of the beach. The action of the waves furnishes much of the food for fish which come in the surf and if you cast way out you frequently have your bait beyond where they are feeding.

Volumes can and have been written about surf fishing. No mention has been made of lines, rods, reels and other equipment. These things could fill several articles by themselves. It is assumed that those who read this will know something about the tackle they will need or will have means of obtaining this information. This article is intended to cover only the barest essentials for those whose knowledge of this type of angling is somewhat limited. My only hope is that some of the hints given herein may someday help you have good sport in the surf.

Surf fishing, even for the experts, is very much of a feast or famine proposition. Yet the man who knows what he is doing always has the best chance of making a good catch. When next you see the restless waves rolling in from the far reaches of the Atlantic and feel the urge to try your luck I sincerely hope that something you have learned from reading this will put at least one more nice fish on the beach for you.

FISHING IN VIRGINIA'S PIEDMONT

(Continued from page 18)

and Buckingham Counties. For additional information on launching sites, the angler should contact the game warden of the county in which he wishes to fish.

The shallow sections of the James can be fished by wading or drifting in a boat. However, caution should be exercised in the rougher sections since the river is often swift and treacherous. Several sections offer excellent water for canoe trips and many miles of shoreline are available to the bank fisherman.

South of the James the angler will find the Appomattox River. The stream is similar to the James but it stays muddy much of the time. This results from floodwater draining through open farmland and it creates conditions more suitable to carp and catfish.

In southern Piedmont anglers enjoy excellent walleye fishing near the city of Danville. Here a dam on the Dan River restricts the upstream progress of these fish and great numbers are caught each spring.

Near Clarksville in Mecklenburg County the Dan and Staunton Rivers meet to form Buggs Island Reservoir, an impoundment of 50,000 acres. In both rivers good fishing can be found for large- and smallmouth bass, crappie, sunfish, channel catfish, bullhead catfish and carp. In the reservoir these same species are taken by anglers plus some walleyes. Below the dam a limited number of striped bass are caught each year.

Kerr Reservoir offers many public boat landings plus private concessions. Live bait is readily available. Additional information on this reservoir can be obtained by writing to the Reservoir Manager, Boydton, Virginia.

In the Patrick-Franklin-Henry-County area lies Philpott Reservoir, a 2800-acre lake, which provides fishing for largemouth bass, a few smallmouth bass, crappie, and sunfish plus rough fishes such as catfish and carp. Public launching ramps are available and a boat concession is in operation. Below Philpott Dam, Smith River offers excellent trout fishing. Headquarters of the Philpott Reservoir manager is Bassett, Virginia.

Commission-owned ponds, in addition to Lake Brittle and Fluvanna Ruritan Lake, are found in Albemarle (Albemarle Lake), Brunswick (Brunswick County Lake), Halifax (Lake Conner), Mecklenburg (Lake Gordon), Pittsylvania (Lake Burton) and Powhatan (two ponds) Counties. All of these Commission lakes are stocked with largemouth bass, crappie and bluegill. Boats are available at all these bodies of water.

The State Department of Conservation and Development, especially the Virginia Division of Forestry and also the Division of Parks, maintains a few lakes in the

Piedmont section. However, they are stocked and managed by the Commission of Game and Inland Fisheries. Most have rental boats for public use. Boats are available at Bear Creek Lake in Cumberland County, Fairy Stone Lake in Patrick County, Holliday Lake in Buckingham County and Prince Edward Lake in Prince Edward County.

Two additional small lakes, without boats, open to public fishing are Winston Lake in Cumberland County and Goodwin Lake in Prince Edward County.

Municipal reservoirs offer limited public fishing in the Piedmont. Lynchburg has Pedlar Lake, open on a permit basis only with a limited number issued each day. Species creeled include largemouth bass, sunfish, crappie, catfish, trout and suckers. The city of Martinsville has a reservoir in Henry County which is stocked with largemouth bass and bluegill.

In various sections of the Piedmont privately owned ponds are open to the public. Lynchburg College Lake, stocked with largemouth bass and bluegill, is open to year-round fishing. Many small watering ponds adjacent to railroads have been opened for fishing. Among the more popular of these are Phoebe Pond in Campbell County and Abilene Pond in Charlotte County.

Through an agreement with the Second Army, four bodies of water are now open to public fishing on Camp Pickett. Boats are not available but privately owned craft can be launched without charge. Fishing is authorized on a permit basis and the permit may be obtained, free of charge, from post headquarters.

It should be pointed out that when fishing from the bank of a large river, the angler must have written or oral permission of the landowner before crossing his property. This should be obtained early to prevent embarrassment and delay while fishing.

The Piedmont offers some fine fishing water for the anglers of the state in addition to streams suitable for boating and canoeing. However, river fishermen and pleasure boaters should exercise extreme caution while on the water. A perfect fishing trip or pleasure cruise can be marred by carelessness. The best insurance while boating is the practice of common sense in handling your craft.

DUCKS IN YOUR BACKYARD (Continued from page 9)

Districts, which include all Virginia counties except Fauquier, may receive technical assistance with pond work from game biologists of the Virginia Commission of Game and Inland Fisheries with offices at 7 North Second street, Richmond 13, Virginia, or the Soil Conservation Service. Construction plans and recommendations for handling vegetation and water may be designed to your specific needs. Farmers who have a pond site on cropland may receive financial help in building a pond from the Soil Bank Program. Information on pond assistance may be obtained from your local County Agent, ASC office, Soil Conservation District office or from the State Game Commission.

I. T. Quinn Commended By House Committee

During the 1958 General Assembly the members of the House Committee on Game and Inland Fisheries presented a resolution commending I. T. Quinn for his outstanding services while executive director of the Virginia Commission of Game and Inland Fisheries.

The resolution was as follows:

Whereas, I. T. Quinn, Executive Director of the Commission of Game and Inland Fisheries, will retire on June thirtieth, nineteen hundred and fifty-eight, after many accomplishments in the field of game management; and,

Whereas, I. T. Quinn has attended the meetings of the House Committee on Game and Inland Fisheries and has been of great assistance in the deliberations of this Committee; and,

Whereas, I. T. Quinn has been ever mindful of the interests of the sportsman and it is only fitting that tribute be paid him upon his retirement; now, therefore, be it

Resolved by the House Committee on Game and Inland Fisheries, That I. T. Quinn be and he hereby is commended for his many accomplishments in the field of fish and game management. Resolved, further, that he be hereby extended the best wishes of this Committee for a long and happy retirement.

Delegates on the committee signing the resolution included B. G. Locher, H. Stuart Carter, Paul W. Manns, George H. Hill, Harrison Mann, Paris I. Leadbetter, L. R. Thompson, Francis B. Gouldman, R. Maclin Smith, Randall Reynolds, Melvin L. Shreves, Robert R. Gwathmey III, and J. C. Moxley.

FISHING—An Art Or A Science?

According to "Dick" Jennings, public relations director of Cortland Line Co., Inc., art has been defined as wisdom in action. Certainly one who goes fishing is being very wise, and in this sense his angling becomes an art.

However, there are some who make of angling an exact science. One such is the remarkable Vic Dorris of Columbus, Ohio. There is nothing hit or miss about Vic. When he sallies forth with his favorite fly rod and Cortland 333 non-sinkable fly line (he will use no other) and nets a fish, things happen. First, Vic whips out his notebook and enters all the vital statistics. Species and size of fish are noted, as well as locale, time of day, temperature of water, direction of wind if any, bait used, and any unusual circumstances.

Here's the scientific angle: By looking over his records, Vic can determine what time of day, what conditions and what bait are most favorable for catching fish of a given species. His impressive take of fish over the years is pretty positive proof that his system works. Vic's "little black book" is coveted by fishermen friends in the same manner that bachelors covet the book of the newly married gay blade!

Back When

A recent gift received at the Virginia Game Commission's law enforcement headquarters at Back Bay was an old battery gun. These weapons were used years ago prior to the introduction of federal laws governing waterfowl shooting.

Warden Cameron Munden displays a battery gun once used for duck shooting in Virginia.

This particular gun was donated by Linwood Walker of Nassawadox, Virginia, and was previously owned by his grandfather. The device is mounted on a block of wood and contains one 8 gauge, one 12 gauge and two 10 gauge barrels of varying lengths. The weapon was discharged by a hammerlock on each side of the wood block and these in turn ignited a string of powder which fired all four barrels.

Walker relates that "back when" this type gun was legal many birds could be killed with a single blast. On one occasion 108 red heads were killed in a single shot and it was reported that as high as 60 brant were knocked down on a different hunt.

Large Whitetail

Word has reached the Richmond office of the Game Commission concerning an exceptionally large buck deer killed during the last hunting season in Rockbridge County.

John Brooks of Roanoke bagged the 10 point buck on national forest land with a 150 yard shot. After being field dressed the animal tipped the scales at 268 pounds, 7 ounces. Allowing a loss of at least 20 percent in dressing, the deer must have weighed at least 320 pounds, live weight. This is certainly a large deer for Virginia since the average is less than 200 pounds.

Night Hunters Apprehended

Sam R. Stanford, game warden from Mathews County, succeeded in breaking up some illegal night duck shooting during the latter part of the past waterfowl season.

The duck blind was a small unit covered with roofing material and resting directly on the sand. Small openings in the front afforded room for two hunters to shoot from the concealing structure. Inside was found a supply of shelled corn for use in baiting ducks to the blind. The birds were shot on clear moonlight nights while feeding near the tar-paper structure.

After close surveillance had been maintained on the blind for a period of time, Stanford and two other wardens arrested the two occupants. The men were convicted on charges of hunting from a baited blind, hunting at night and hunting from a nonlicensed blind. Each hunter paid a fine of $100.00 and costs for their illegal procedures in obtaining waterfowl.

New Warden in Orange County

John W. Crickenberger, a 34 year old resident of Orange, Virginia, has been appointed as the new game warden in Orange County following the retirement of William D. Mann.

Twelve applicants applied for the job and Crickenberger was selected from the top three.

The new warden has resided in Orange for the past 15 years and worked as an automobile mechanic for a local firm.

Crickenberger is a veteran of World War II having served 33 months with the U. S. Army in the European theater.

Residents in the Orange County area are looking forward to a long and happy association with their new game warden.

Ducks Fed By Plane

During the freeze-up in February, most of the streams and bays in Virginia became coated with ice. As a result, ducks and geese were deprived of their usual food and they searched elsewhere for edible material.

Realizing that the waterfowl food situation was critical, the Commission distributed several tons of corn to ducks and geese at Hog Island and Back Bay. In the Back Bay area corn was scattered by both the Commission airplane and helicopters provided by the Navy. While hovering low in the helicopters, four or five hundred pounds of grain could easily be dumped over a wide area.

The Commission's new Piper Super 150, used for dropping corn in the Back Bay area.

Wildlife Questions and Answers

Edited by Dan E. Cantner

***Ques.:* Is the snow goose ever found in Virginia?**

Ans.: This goose is found in Virginia during the winter months. It winters on the Atlantic coast from Maryland to North Carolina and during the past season a flock of approximately 35,000 of these birds was located on the Virginia-North Carolina line.

***Ques.:* Where are fish most likely to be found in our fresh water streams?**

Ans.: Most of the streams that are without dams are made up of rapids and pools. Fish are more likely to be found in the heads of the pools where fresh water is pouring in. Food is more easily obtained in this section of the pool and it lies near the deeper water which affords protection in emergencies.

***Ques.:* What is the smallest fish in the world?**

Ans.: The Philippine goby is probably the smallest fish known to mankind. This species, appropriately named *Pandaka pygmaea*, is only one-fourth inch long at maturity.

***Ques.:* Does the chipmunk dig burrows for its living quarters?**

Ans.: Yes, but the openings of the burrows are seldom seen. While digging the burrow the chipmunk usually moves excess dirt several feet away from the opening or constructs two openings. The first opening is then plugged and the second is established beneath some concealing object such as a rock or low shrub.

***Ques.:* Is refrigeration necessary for smoked fish?**

Ans.: There are two methods commonly used in smoking fish. These are referred to as mild or cold smoking and hot smoking. If fish are smoked properly by the hot process, they will keep for approximately 10 days without refrigeration. When processed with the cold method of smoking, fish may not be properly preserved and should be refrigerated.

***Ques.:* While reading various publications on birds I often see the abbreviation A.O.U. Could you tell me what this stands for?**

Ans.: This abbreviation stands for the American Ornithologists' Union which was organized in 1883. The main objectives of the organization include the standardization of the common and scientific names of birds and checking the authenticity of newly described species. The A.O.U. sponsors the publication of a technical journal called the *Auk* and also the *Check List*, both of great importance to bird watchers.

"Finally caught something, eh?"

***Ques.:* What is the period of residence required for buying a resident Virginia hunting or fishing license?**

Ans.: The law states that a person must reside in Virginia for a period of six months before making application for a resident license.

***Ques.:* Is the Game Commission still engaged in a raccoon restocking program?**

Ans.: No. The commission stopped restocking the raccoon over a year ago.

***Ques.:* Is it true that fleas can jump great distances?**

Ans.: Although a flea is small, authorities say it is capable of jumping three to four feet. Also, the flea can lift 140 times its own weight. If a man could do this he would be capable of lifting a ten-ton truck.

***Ques.:* How fast do the hummingbirds' wings travel while flying?**

Ans.: The stroke or beat of this bird's wings varies according to the speed it is traveling and may be from 75 to 200 strokes per second. The hummingbird is capable of fast maneuvering and can fly backward as well as forward.

***Ques.:* What type of animal is the sand flea found along our Atlantic coast?**

Ans.: This is a small crustacean found living on sandy shores and it feeds in the wash of the waves. The species common to the Atlantic coast from New England to Florida is *Emerita talpoidea* and varies from one to two inches in length.

***Ques.:* Do we have any state parks which allow overnight camping in tents?**

Ans.: Fairy Stone Park in Patrick County, Hungry Mother Park in Smyth County and Westmoreland Park in Westmoreland County have facilities for overnight tenting and also for overnight trailer parking. The maximum time allowed for camping is two weeks. For additional information write to the Department of Conservation and Development, Division of Parks, State Office Building, Richmond 19, Virginia.

***Ques.:* Are snakes commonly found in the caves of Virginia?**

Ans.: Although snakes often den together in great numbers during the winter months, they are seldom found in caves. The constant yearly temperature of our caves runs from 50° to 55°F. and they are too cold for snakes.

***Ques.:* Do fish always lay eggs in the water?**

Ans.: Most fish lay their eggs in water. On the west coast, however, there is a small fish known as the grunion which lays its eggs on land. During the high spring tides the female goes up on the beach and lays her eggs whereupon they are fertilized by the males. Two weeks later a second high tide washes these eggs out of the sand into the water and they hatch.

***Ques.:* Is the black bear cub born with its eyes closed?**

Ans.: Most animals are born with their eyes closed and bear cubs do not open their eyes until they are around 40 days old.

Having unwanted pets humanely destroyed is more kind and more humane than abandoning them to nature.

FERAL DOGS AND CATS

Abandoned cats often become efficient predators and destroy many nesting game and song birds.

The best behaved dog may become part of a hunting pack if allowed to run at night.

Dogs should be closely confined during May and June. It is then that pregnant does and young fawns are easy prey.

Normally, wild predators are controlled by their food supply and by hunting and trapping.

These controls are not very effective against prowling pets.